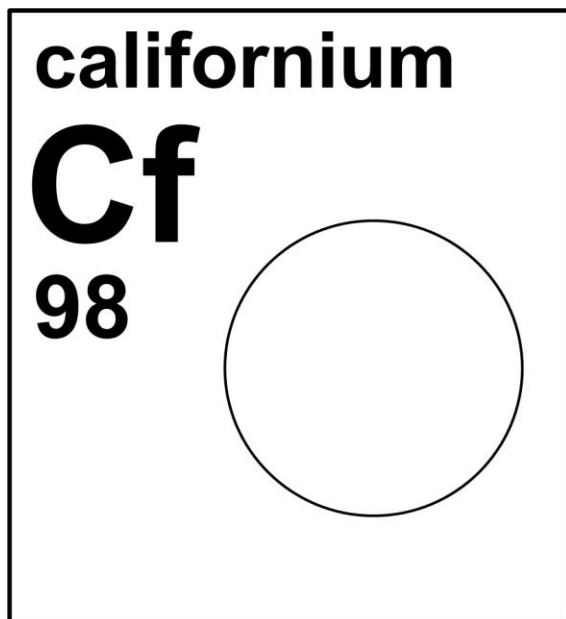





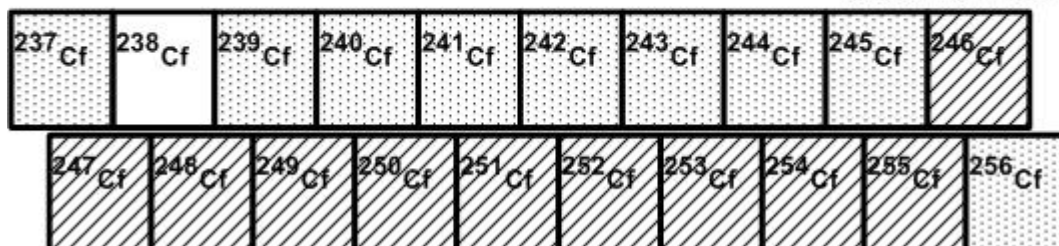
californium



Stable isotope	Atomic mass	Mole fraction
(none)		

Half-life of radioactive isotope

Less than 1 second 
Between 1 second and 1 hour 
Greater than 1 hour 



Important applications of stable and/or radioactive isotopes

Isotopes in medical physics

- 1) ²⁵²Cf is sometimes used as a source of neutrons in boron neutron capture therapy (BNCT) that can be delivered close to the region of a tumor.
- 2) Brachytherapy can use ²⁵²Cf to treat many types of cancer.



Figure 1: KL-²⁵²Cf Neutron Brachytherapy System.

Isotopes in nuclear physics

- 1) ^{252}Cf is a very active source of neutrons (2.3×10^6 neutrons per second per microgram) with a half-life of 2.6 years. The energy spectrum of the neutrons is very similar to that of a fission reactor and small amounts of ^{252}Cf provide an ideal portable source for low neutron flux applications.
- 2) ^{252}Cf is used for the Prompt Gamma Neutron Activation Analysis (PGNAA) of weapon components and chemical munitions. This method provides quick and non-destructive elemental analysis of a sample. For example, ^{252}Cf as the neutron source for PGNAA is used to detect the presence of antitank mines.
- 3) A source of fission fragments used in research is thin foils containing ^{252}Cf .

Isotopes in industry

- 1) Neutron activation analysis (NAA) uses ^{252}Cf as a portable neutron source to identify silver or gold ore.
- 2) ^{252}Cf can be used in moisture gauges to locate water.